Introducing

the family of

NCR 315

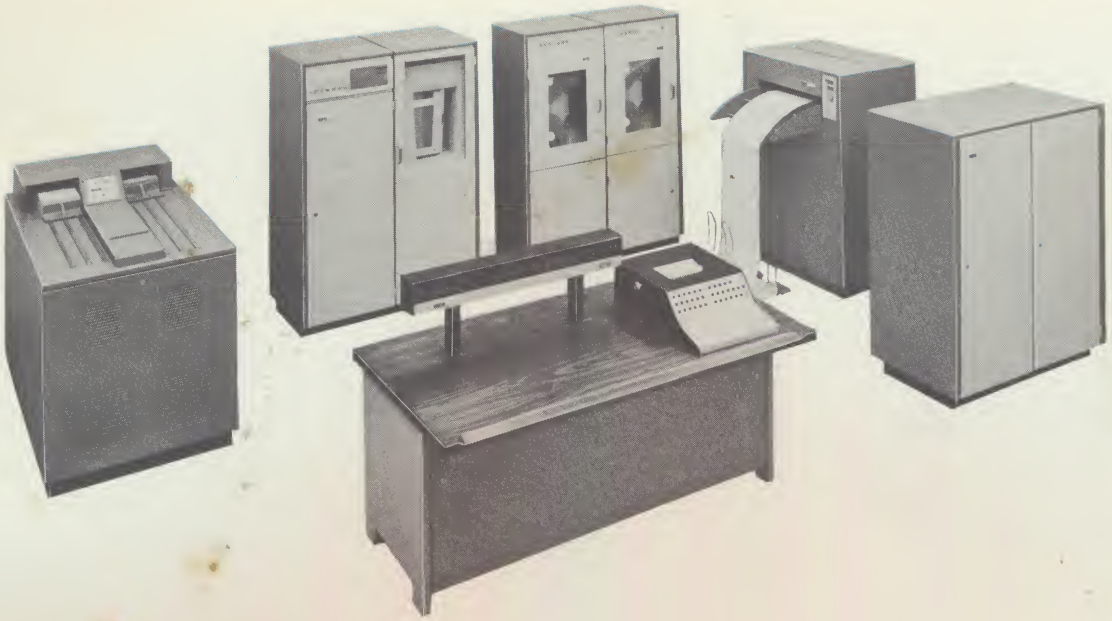
COMPUTERS

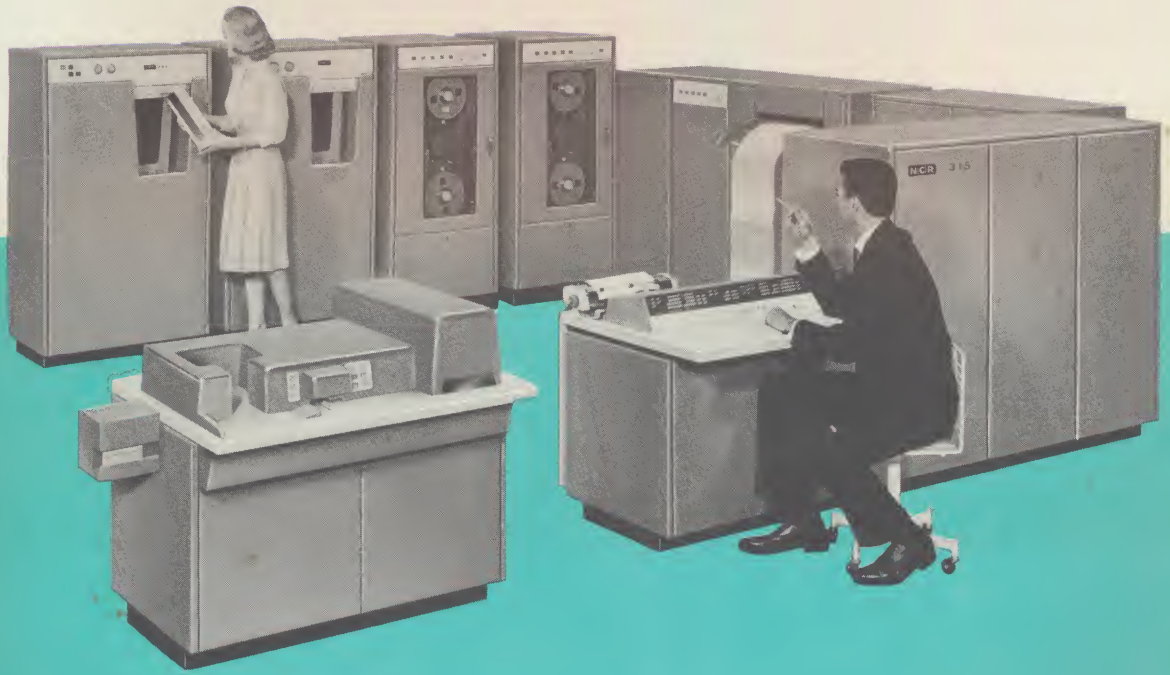
What is the 315 family?

The 315 family is a line of computers designed with like characteristics. Each member has traits and abilities unique to itself, yet each has family characteristics that enable it to work as part of a compatible computer team. Each is identifiable by name — 315, 315-100 and 315 RMC (Rod Memory Computer). Yet, each uses the same input/output devices; each is capable of performing random, sequential, real-time, or remote inquiry types of processing; and each permits you to tailor your EDP System to your specific needs.

It's an expansible family!

Starting with the processors, every component is designed with **compatible growth** in mind. You install just those components needed to take care of your data processing requirements today . . . and add components as volumes and activities warrant. Processors are available with basic cycle times of 6 microseconds and 800 nanoseconds . . . memory ranges from 10,000 to 160,000 characters. Card reading speeds range from 100 to 2000 cards per minute. Magnetic tape units are available with data transfer speeds ranging from 12,000 to 120,000 characters per second. Card Random Access Memory (CRAM) units are available with data transfer speeds from 38,000 to 100,000 characters per second. These and other components are described in further detail on the following pages of this brochure.

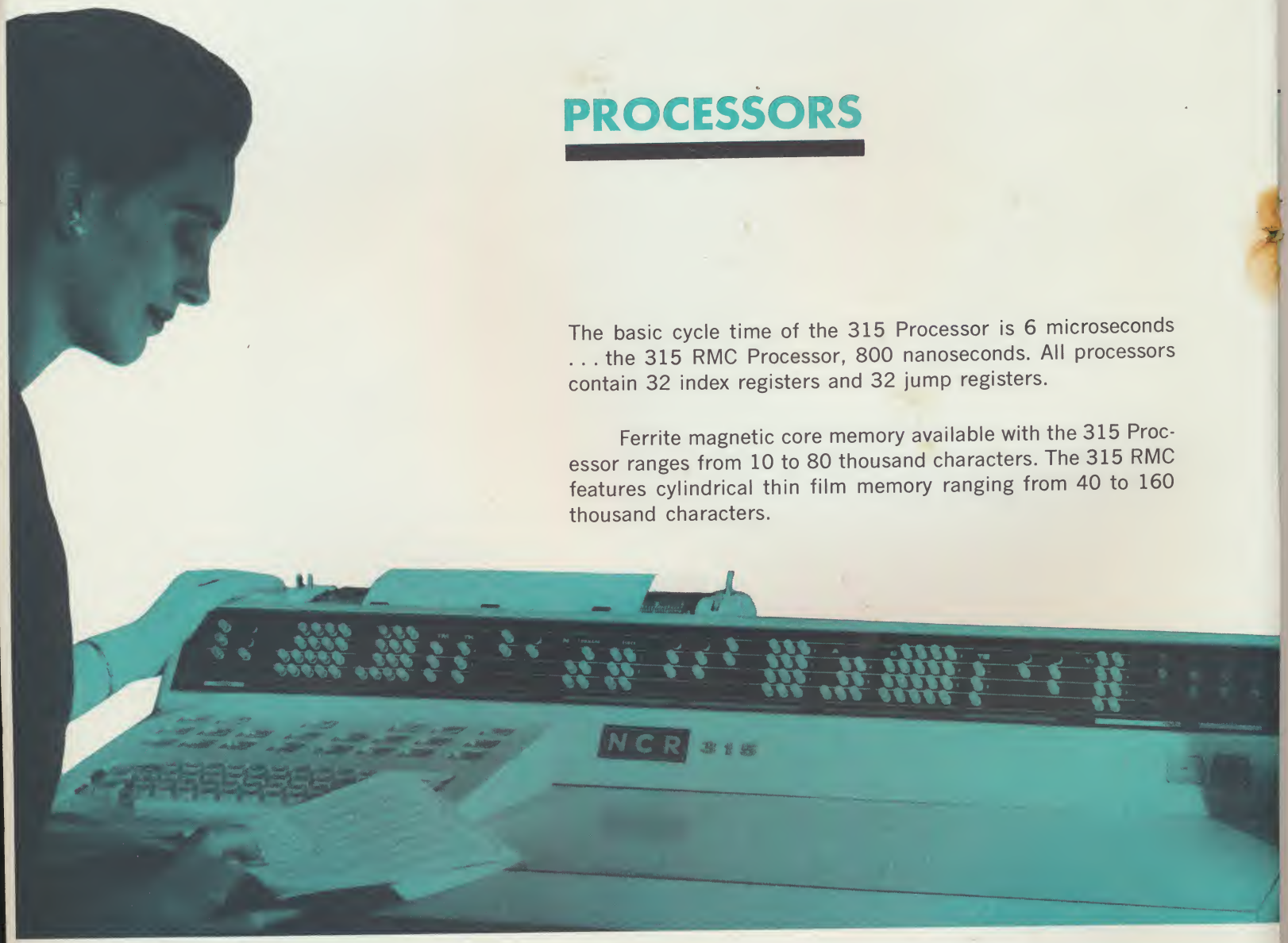




It's a compatible family!

All members of the 315 family "talk" the same language — they have the same command and data structure . . . all programming is compatible. All members are backed by the most efficient and sophisticated package of software available in the industry. This means that 315 users have complete, thoroughly tested packages of software available to them, regardless of which processor is chosen. This also means that systems can be expanded efficiently and economically — programming costs, programming time, and programming changes are held to an absolute minimum.

PROCESSORS



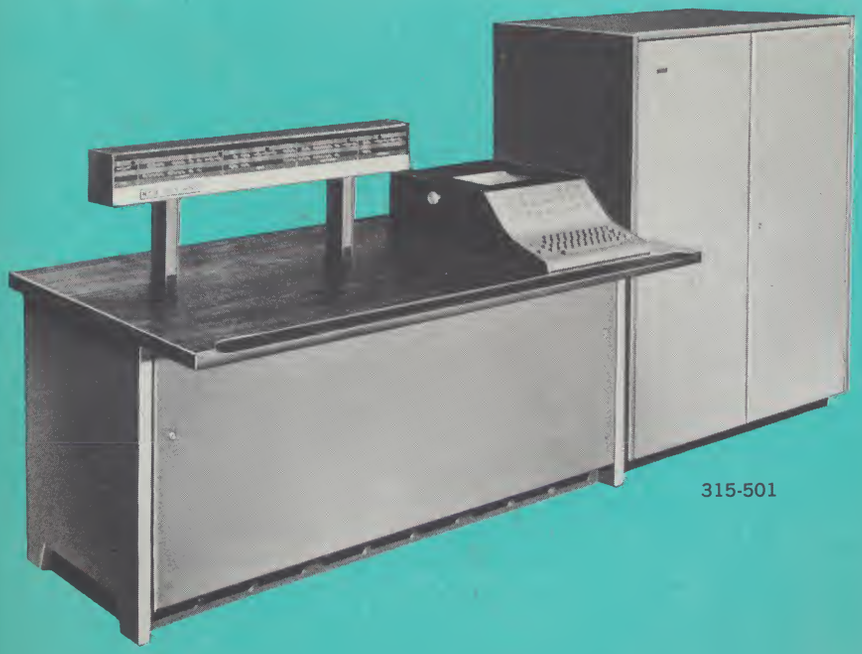
The basic cycle time of the 315 Processor is 6 microseconds . . . the 315 RMC Processor, 800 nanoseconds. All processors contain 32 index registers and 32 jump registers.

Ferrite magnetic core memory available with the 315 Processor ranges from 10 to 80 thousand characters. The 315 RMC features cylindrical thin film memory ranging from 40 to 160 thousand characters.

NCR Processor construction employs printed circuits, transistors, magnetic cores or cylindrical thin films, and other solid-state devices which reduce space, power requirements and air conditioning costs; while at the same time providing greater reliability.

The 315 Processors perform control functions by causing the necessary circuits to align in the proper sequence in order to execute each individual instruction. The Processors also control the internal flow of data and the transfer of data between the memory and associated peripheral units. Standard arithmetic and logical commands are provided, and in addition, there are specialized business type instructions.

315



315-501

315-3 File Processor

315-35 File Inquiry Processor

315-4 Bank File Processor

315-45 Bank File Inquiry Processor

- Magnetic core memory expandable from 10 to 80 thousand characters
- Basic Cycle Rate . . . 6 microseconds
- Solid-State Design . . . transistors, printed circuits, magnetic cores
- Single address type of instruction
- Double-Stage instructions for more complex commands
- Variable length operands provide ability to specify number of slabs
- 32 Index Registers
- 32 Special Registers for jumping and linking
- 12-bit word structure—2 alphanumeric or 3 numeric digits
- Modular construction
- Unit Interrupt Facility under program control
- Controls all peripheral units

315-101 Data Processor

Specifications as above . . . the following features are optional:

- File Adapter . . . required with CRAM or Tape
- Multiply-Divide . . . required if built-in command is desired
- MICR Buffer Adapter . . . required if a buffered sorter is used
- Inquiry Buffer Adapter . . . required if window machines or buffered inquiry are to be used
- Unbuffered Inquiry Adapter . . . required if unbuffered inquiry is to be used
- Card Read-Punch Adapter . . . required if card read-punch is to be used

315-501 RMC (Rod Memory Computer)

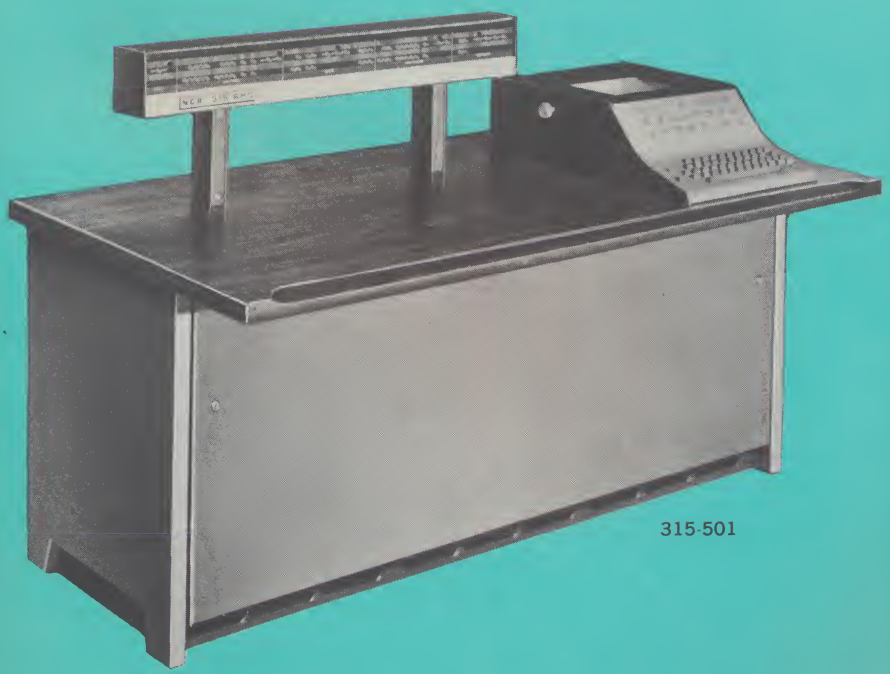
- Cylindrical thin film memory expandable from 40 to 160 thousand characters
- Basic Cycle Rate . . . 800 nanoseconds
- Built-in Floating Point and Real-Time instructions provided
- Other specifications as for the basic 315

CONTROL CONSOLES

Control Consoles of the NCR Electronic Data Processing Systems enable the operator to centrally control and monitor all processing functions. The Indicator Light display panel is designed for simple, efficient supervision. Eight option and other control switches provide external control over variable program functions.

An electric typewriter provides direct communication with the processor memory. Data can be entered into memory through the typewriter keyboard. The processor can transmit data to the typewriter for message output. Thus, through the console typewriter, the operator can interrogate processor memory, receive instructions and file data, input programs, and input instructions to modify a program.

315

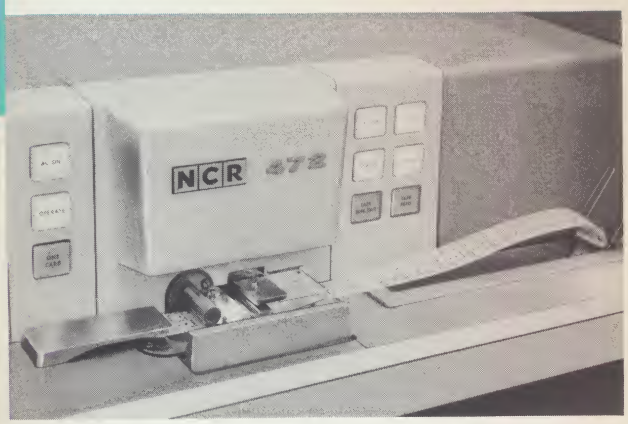


315-501

315 Consoles

- Binary coded decimal display of main memory address
- Provides direct communication to and from memory
- Program modification facility
- Single cycle operation ability
- Complete indication for cause of error halt
- 8 Option Switches
- Typewriter print speed of 10 characters per second
- Provides facility for entire system monitoring by one person
- Human engineering principles of design
- Powered from Processor

PUNCHED PAPER TAPE



NCR offers a wide range of paper tape input and output capabilities—reading speeds of 600 or 1000 characters per second —punching speeds of 110 and 120 characters per second.

Translation and parity checks are performed between character readings. This provides the ability to time-share computations between characters. Time-sharing is also provided between punching of characters.

Punched paper tape can be created as an independent operation through the use of NCR Accounting Machines, Cash Registers and Adding Machines; or through other paper tape systems such as communication networks. Punched paper tape thus created is then read into the 315 for electronic processing. During processing, the 315 system can output paper tape for re-entry into the system or for transmittal of data to other locations or other computer systems.

Any code can be input or output. Translation of any code into, or from, 315 code is performed by table look-up between characters. Thus, reading or punching proceeds at full speed.

361-201

371-201

472-1

361-201 Paper Tape Reader

- Reads 600 characters per second
- Time shared between characters
- Translation and parity check performed between characters
- Reads 5, 7 or 8 channel codes
- Tape acceleration under 8 milliseconds
- 1000 foot reel capacity
- Photo-electric reading
- Tape widths: 11/16", 7/8" or 1"
- Tape thicknesses: .004" to .0045" Mylar

Up to two with any processor

371-201 Paper Tape Punch

- Punches 120 characters per second
- Time shared between characters
- Translation and parity check performed between characters
- Punches 5, 7 or 8 channel codes
- Tape acceleration under 8 milliseconds
- 1000 foot reel capacity
- Tape widths: 11/16", 7/8" or 1"
- Tape thicknesses: .004" to .0045" Mylar

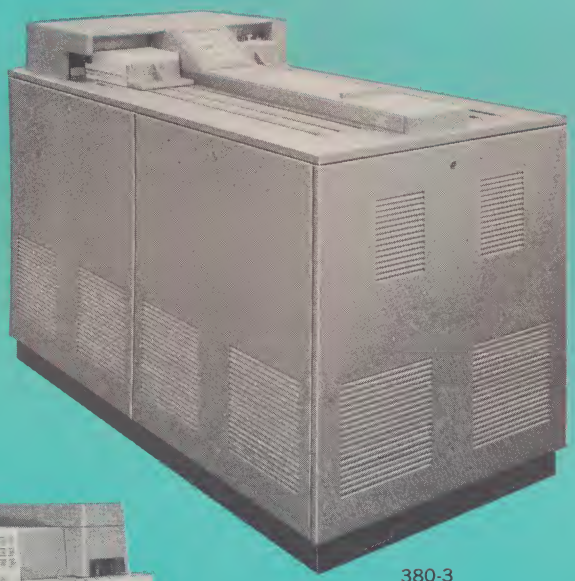
Up to two with any processor

472-1 Paper Tape Read—Punch

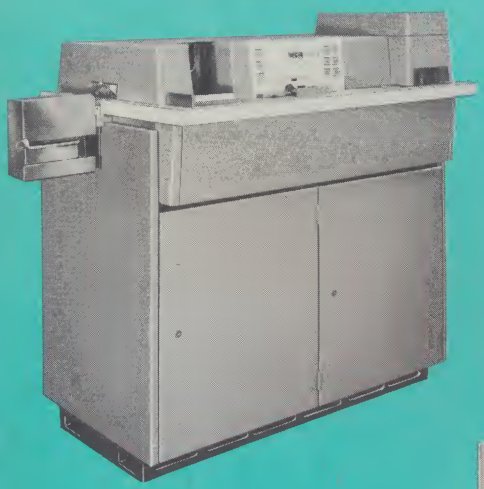
Not available with 315-101 or RMC

- Reads 1000 characters per second
- Punches 110 characters per second
- Time sharing between characters . . . reading and punching
- Translation and parity check performed between characters
- Reads and punches 5, 6, 7 or 8 channel codes
- Tape acceleration under 5 milliseconds
- Photo-electric reading
- Tape widths: 11/16", 7/8" or 1"
- Tape thicknesses: .004" to .0045" Mylar

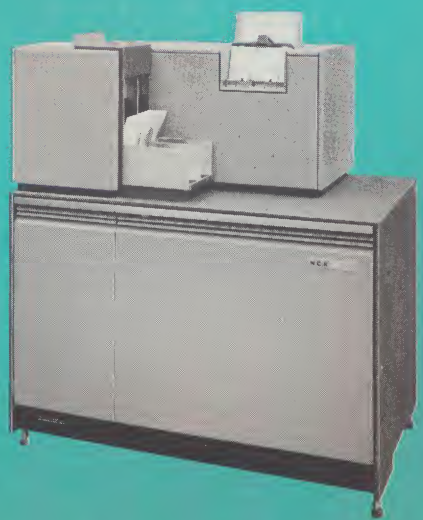
376-101



380-3



472-2



376-7

CARD PUNCHING

376-101

- Punches 250 80-column cards per minute
- Input hopper capacity . . . 1200 cards
- Output hopper capacity . . . 1500 cards
- Requires 354-101 Card Punch Buffer

376-2

- Punches 100 80-column cards per minute
- Input hopper capacity . . . 1000 cards
- Output hopper capacity . . . 1200 cards
- Requires 354-101 Card Punch Buffer

CARD READING

380-3

- Reads 2000 80- or 90-column cards per minute
- Input hopper capacity . . . 5000 cards
- Output hopper capacity . . . 5000 cards
- Photo-electric reading . . . reads a portion or the complete card
- Reads 12 bits directly into memory, one column per slab . . . or, decodes through matrix in reader

472-2

- Reads 400 80- or 90-column cards per minute
- Input hopper capacity . . . 700 cards
- Output hopper capacity . . . 700 cards
- Photo-electric reading . . . reads a portion or the complete card

(Not available with 315-RMC)

CARD READING AND PUNCHING

376-7

- Reads 300 80-column cards per minute
- Punches 50 to 270 cards per minute
- Input hopper capacity . . . 1200 cards
- Output hopper capacity . . . Two hoppers, 1300 cards each
- Photo-electric reading . . . reads a portion or the complete card

Requires 354-601 Card Read/Punch Controller

(Not available with 315 RMC)

376-8

- Reads 400 80-column cards per minute
- Punches 91 to 360 cards per minute
- Input hopper capacity . . . 1200 cards
- Output hopper capacity . . . Two hoppers, 1300 cards each
- Photo-electric reading . . . reads a portion or the complete card

Requires 354-601 Card Read/Punch Controller

(Not available with 315 RMC)

All units permit maximum time-sharing through demand interrupt feature.

Up to four punching units and printers, in any combination, with any processor.

MAGNETIC CHARACTER SORTER-READERS

The NCR 402 and 407 Magnetic Character Sorter-Readers are designed to read and translate Type E 13B magnetic ink font. Intermixed documents of various lengths, widths and thicknesses can be read and sorted.

Document handling rates are 750 and 1200 items per minute. All models may be operated off-line or under control of the processor. Sorting may be accomplished on a whole field, partial field, or on a digital basis in any desired order.

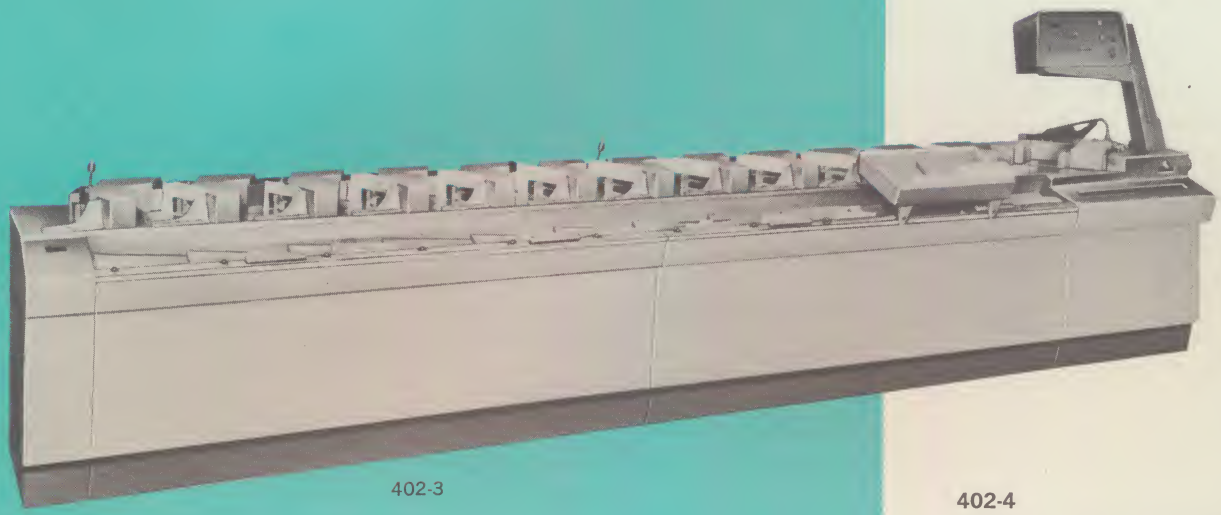
Processing time is available between characters as well as between documents, thus providing maximum time-sharing capabilities.

Large pocket and feed-station capacities, and conveniently placed control consoles combine to increase operator efficiency . . . increase document throughput.

Models 402-3 and 407 are fully buffered and may be multiplexed. The unbuffered 402-4 may not be multiplexed.

402-3

- Reads and sorts 750 documents per minute
- 12 receiving compartments with capacity of from 1200 to 1500 documents
- Programmable to sort on . . .
  - whole numbers
  - block numbers
  - digits
- Endorsing feature, if desired
- May be multiplexed with the 355-1 Sorter Buffer

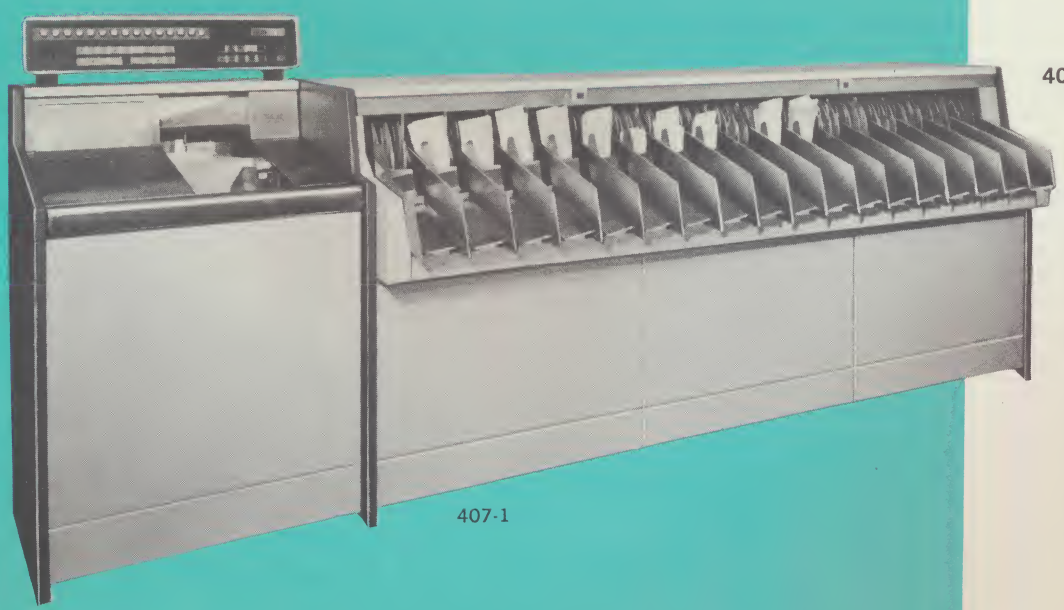


402-3

402-4

(Cannot be multiplexed)

- Reads and sorts 750 documents per minute
- 12 receiving compartments with capacity of from 1200 to 1500 documents
- Programmable to sort on . . .
  - whole numbers
  - block numbers
  - digits
- Endorsing feature, if desired



407-1

407-1

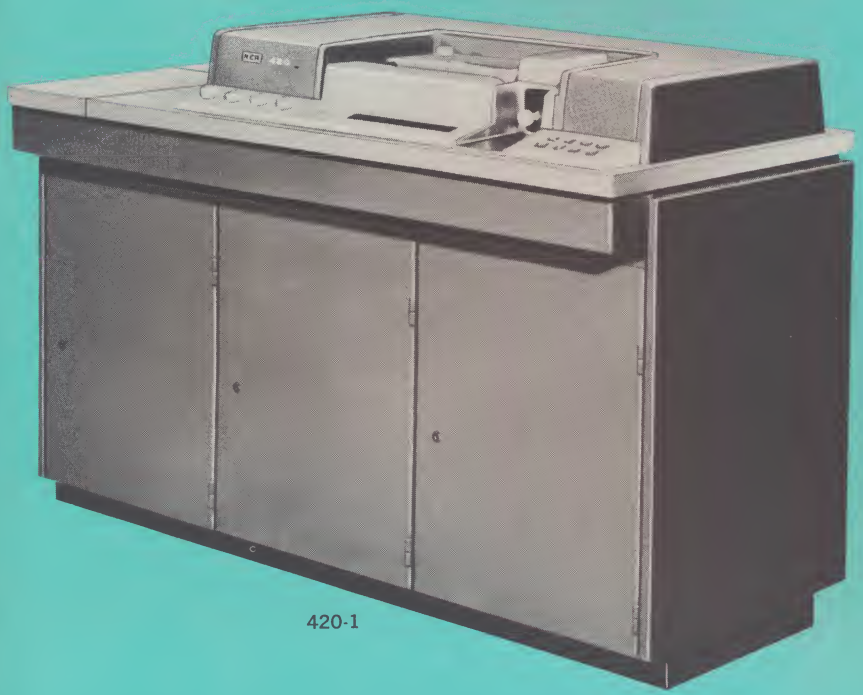
- Reads and sorts at a constant speed of 1200 documents per minute
- 18 receiving compartments with capacity up to 1400 to 2000 documents
- Programmable to sort on . . .
  - partial field
  - whole numbers
  - block numbers
  - digits
- Pocket Pull-out feature provides for direct sort of up to 6 large volume accounts—off-line . . . programmable by removable plug-board
- Endorsing feature console controlled
- Date and Batch numbering controlled by processor or console
- Multiple sorters may be on-line
- Feed station capacity of 3000 documents
- Doubles detection facility provided

OPTICAL JOURNAL READER

The NCR Optical Journal Reader provides input to the 315 family of Processors from journal tapes at the rate of 26 lines per second. These journal tapes can be created on NCR Accounting Machines, Adding Machines or Cash Registers that have been equipped with optical font.

In an off-line mode, the Optical Reader can be linked to a Model 371 Paper Tape Punch to convert the data on the journals into the paper tape format.

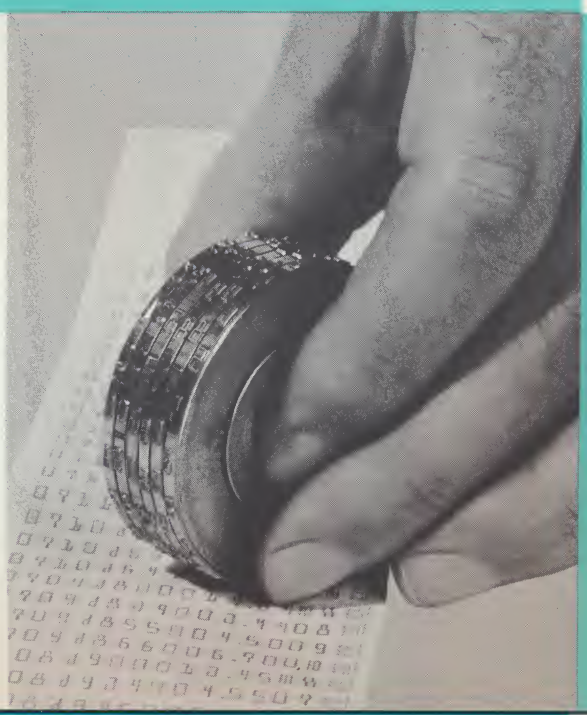
The self-checking Optical Character Code is made up of the digits 0 to 9 and six special symbols. The Reader can be programmed to automatically re-read lines in the case of sub-standard printing. After re-reading a line a given number of times . . . and the line is still unreadable . . . the Reader can either be halted for immediate manual entry of the line or it can be automatically marked for subsequent entry after the entire journal has been read.



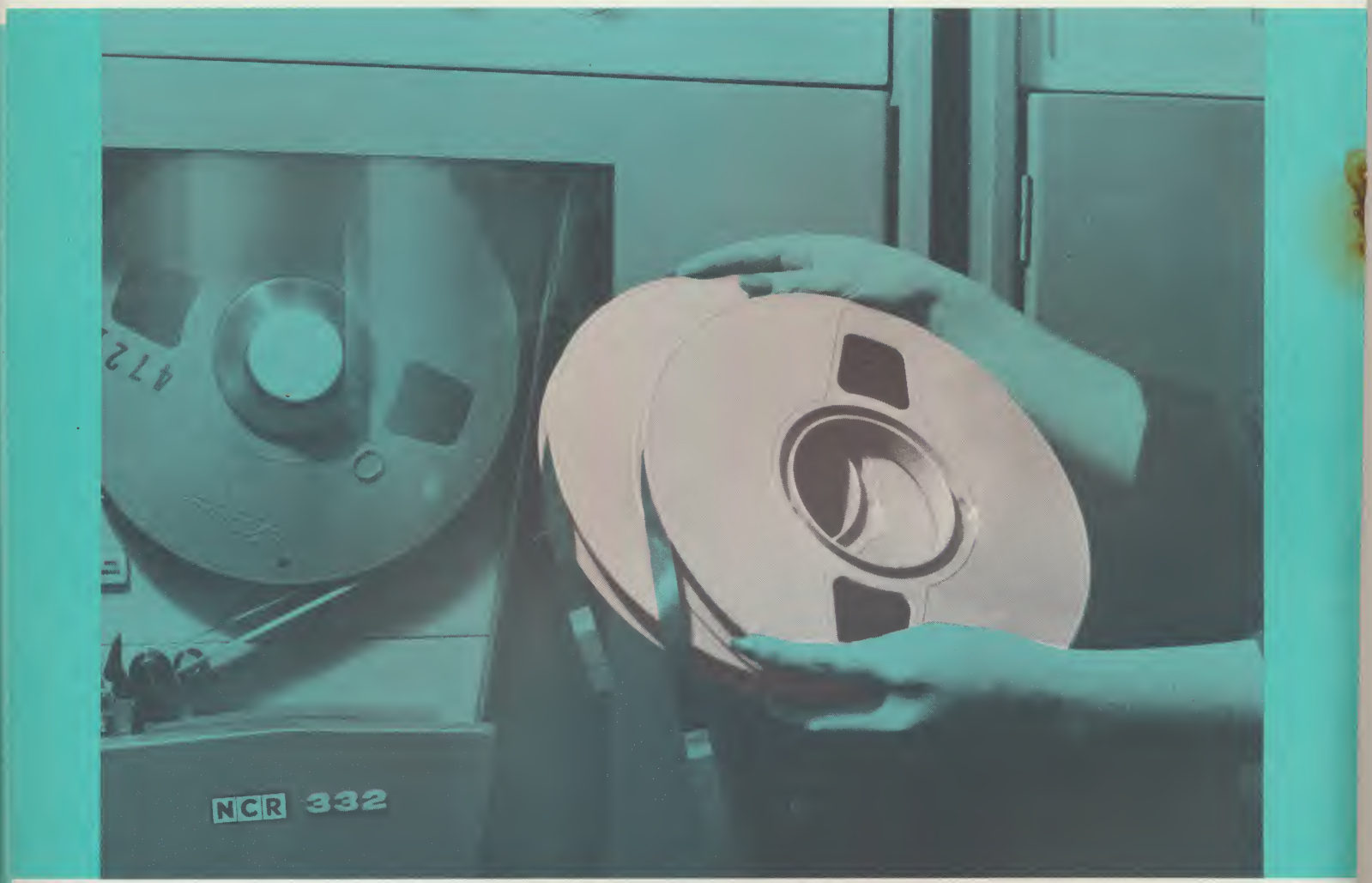
420-1

420-1

- Reads 26 lines per second
- Up to 30 characters per print line
- Readable characters per print line . . . 20
- Journal Tape width: 1-5/16" to 3¼" Length: 11" to 1200" including 8" leader
- Off-line output to 5 channel paper tape
- 4 Programs
- Up to four readers on-line to processor
- Ability to read variable journal formats controlled through plug-board



MAGNETIC TAPE HANDLERS

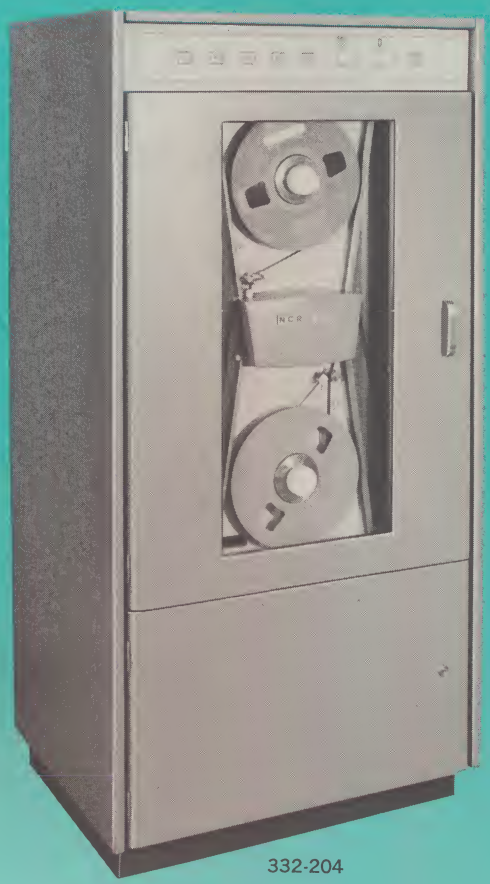


NCR Magnetic Tape Handlers provide data transfer rates ranging from 12,000 to 120,000 characters per second. Up to eight tape units can operate under control of the 315 Processor . . . however, with controller, 16 magnetic tape files may be on-line. The 315-101 Processor requires a File Adapter if magnetic tapes are to be used.

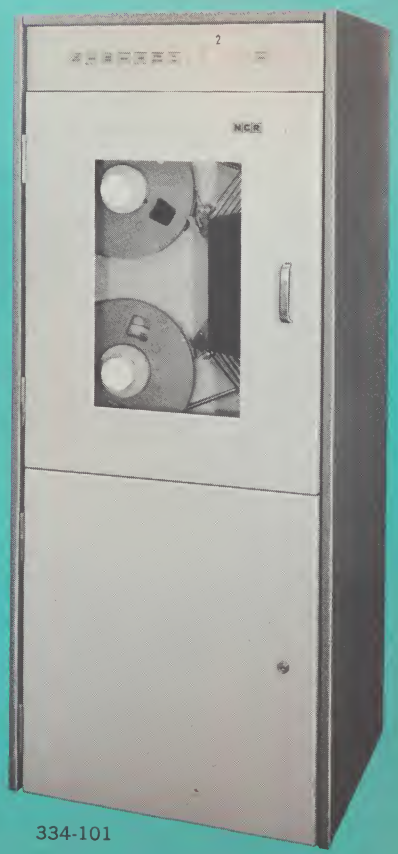
The 334-101 and -131 contain the necessary electronics to control up to four 334-102 or -132 Magnetic Tape Handlers.

All models incorporate the simultaneous read-after-write feature which enables data to be read and verified for correctness while writing. The Model 324-1 Controller provides read-read, read-write, write-write, read-compute or write-compute simultaneity. Complete read-write-compute simultaneity is provided with the 324-2 Controller.

333-102



332-204



334-101

332-204

- Data transfer rate of 24,000 and 66,000 characters per second
- Recording density 556 alphanumeric characters per inch, odd or even parity — 200 per inch, odd parity
- Tape transport speed 120 inches per second

333-101

- Data transfer rates of 83,000 or 120,000 characters per second
- Recording densities 800 or 556 alphanumeric characters per inch, odd or even parity
- Tape transport speed 150 inches per second

333-102

- Data transfer rate of 30,000 or 83,000 characters per second
- Recording densities 556 or 200 alphanumeric characters per inch, odd or even parity
- Tape transport speed 150 inches per second

334-101 & 334-102

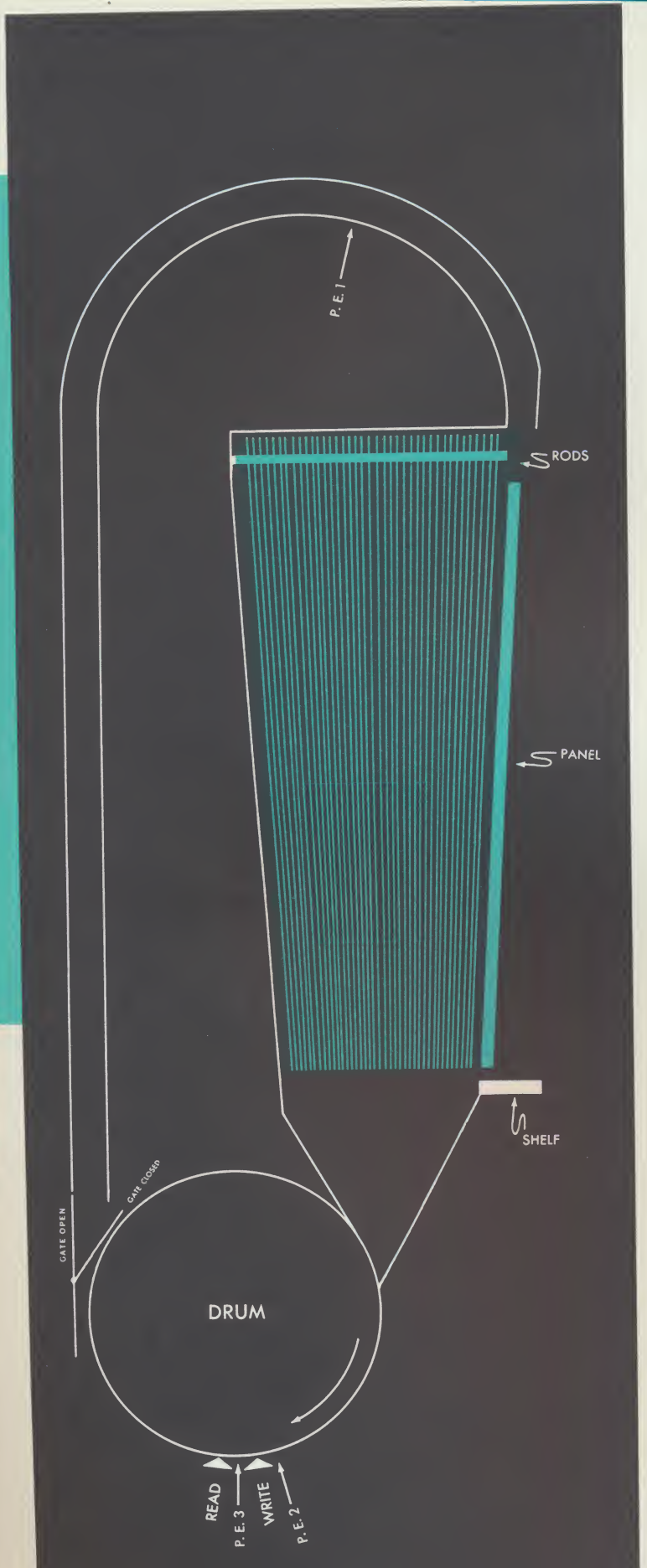
- Data transfer rate of 12,000 characters per second
- Recording density 200 alphanumeric characters per inch, odd or even parity
- Tape transport speed 60 inches per second

334-131 & 334-132

- Data transfer rate of 12,000 or 33,000 characters per second
- Recording densities 556 alphanumeric characters per inch, odd parity—200 per inch, odd or even parity
- Tape transport speed 60 inches per second

APPLICABLE TO ALL MODELS

- Mode of recording . . . variable length records, 2 to 16,000 alphanumeric characters
- Reel capacity 2400 feet, ½" Mylar, 1.5 mil
- Use Lockout optional on rewind
- Up to eight handlers under control of processor . . . 16 with 324 Controller



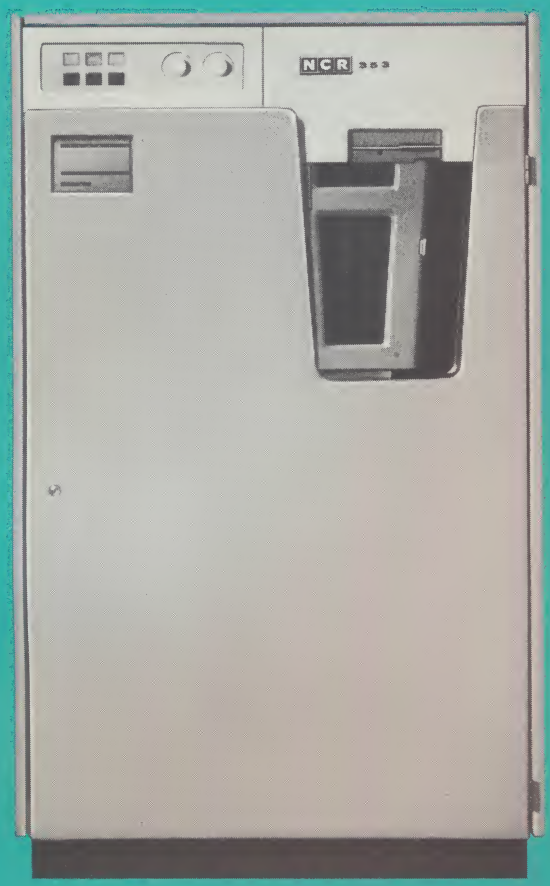
CARD RANDOM ACCESS MEMORY FILES

Card Random Access Memory (CRAM) units provide file storage for high-speed random or sequential processing of data. Recording of data is accomplished on magnetic cards, 3¼" x 14". Model 353-1 provides 256 cards per deck containing seven recording tracks per card. Each track provides a storage capacity of 3100 alphanumeric characters. The cards on Models 353-2 and -3 contain 56 recording tracks capable of storing 1120 alphanumeric characters per track.

Storage capacity of a CRAM deck ranges from 5.5 to 16.0 million alphanumeric characters with data transfer rates from 38 to 100 thousand characters per second. Access to any card is provided in approximately 1/5 of a second.

Up to 16 CRAM units can be controlled by the processor at one time. Thus a total on-line storage capacity of from 88 to 256 million alphanumeric characters is provided.

A deck of magnetic cards can be removed from a CRAM unit and a new deck mounted in less than one minute.



353-1

353-2

353-1

- Data transfer rate of 100,000 alphanumeric characters per second
- Recording density 250 characters per inch
- Recording media 3¼" x 14" Mylar cards
- Seven recording tracks per card
- Track capacity 3100 alphanumeric characters
- 256 cards per deck . . . storage capacity 5.5 million alphanumeric characters
- Up to 16 CRAM handlers on-line
- Unit interrupt facility when card is in read-write position
- For 315-101, High Speed File Adapter and CRAM File Adapter are required

353-2

- Data transfer rate of 38,000 alphanumeric characters per second
- Recording density 700 bits per inch
- Recording media 3¼" x 14" Mylar cards
- 56 recording tracks per card
- 1120 alphanumeric characters per track
- 128 cards per deck . . . storage capacity 8 million alphanumeric characters
- Up to 16 CRAM handlers on-line
- Unit interrupt facility when card is in read-write position
- 315-101 requires CRAM File Adapter

353-3

- Data transfer rate of 38,000 alphanumeric characters per second
- Recording density 700 bits per inch
- Recording media 3¼" x 14" Mylar cards
- 56 recording tracks per card
- Track capacity 1120 alphanumeric characters
- 256 cards per deck . . . storage capacity 16 million alphanumeric characters
- Up to 16 CRAM handlers on-line
- Unit interrupt facility when card is in read-write position
- 315-101 requires CRAM File Adapter

CRAM

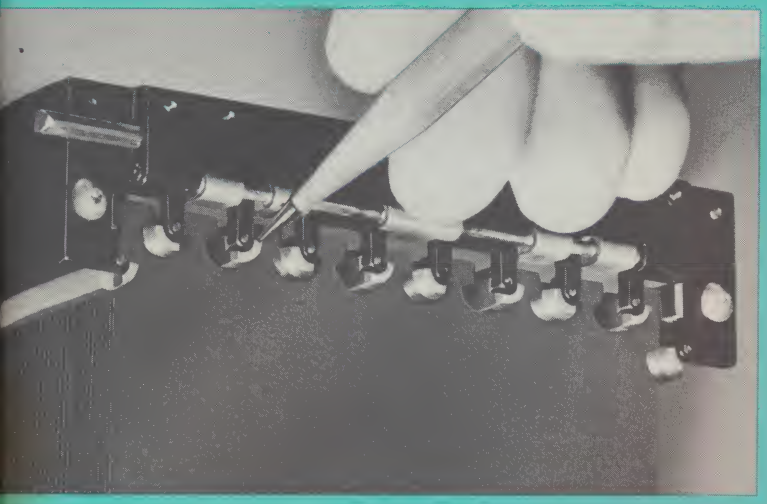
a performance-proven random access file storage

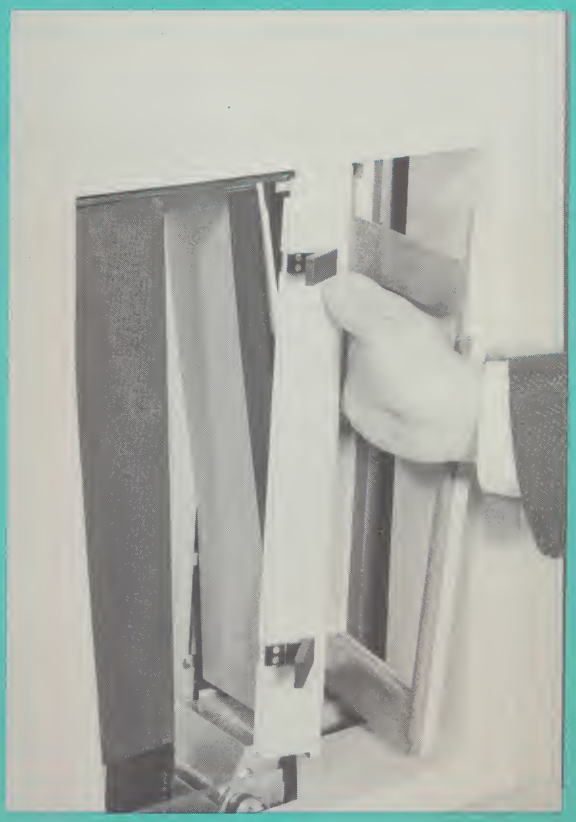
Card Random Access Memory (CRAM) provides a flexible economical magnetic file system. It can be used like magnetic tapes, disks or drums. Information can be batched and processed sequentially . . . it can be processed in-line on a random basis . . . it can be sorted and selectively recorded — serially processing only those records that are active, completely by-passing inactive records.

CRAM permits multiple types of data to be stored in a **single** deck of cards. Many routines that require two to eight magnetic tape handlers can now be performed on one or two CRAM units. CRAM eliminates the need for separate source and destination handlers, greatly reducing the cost of magnetic file storage.

CRAM provides fast access to an unprecedented range of information. In a single computer run, information can be sorted, all related records can be updated, report information can be generated and stored, additional program information read, and reports printed out. All accomplished without human intervention . . . all accomplished through the flexibility provided by CRAM.

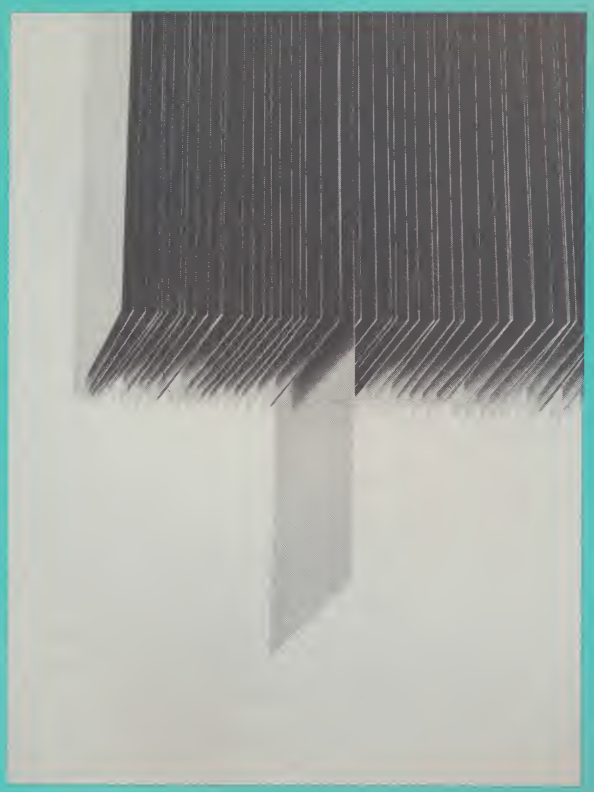
Unlike magnetic tape systems, CRAM requires no re-winding. Since a CRAM cartridge can be easily removed and a new one mounted in less than one minute, data stored off-line may be placed on-line as needed.





CARD SELECTION

When mounted on the CRAM unit, the deck of magnetic cards is suspended from two gating rods. The cards are individually selected by eight electronically controlled two-position rods. Each of the cards has a unique binary notching configuration that permits it to be released from the deck when selected. For example; if card number five is addressed by the computer, the eight two-position rods are automatically set to the binary configuration of five . . . the gating rods are opened . . . and the card with the notching configuration of five is released from the deck.



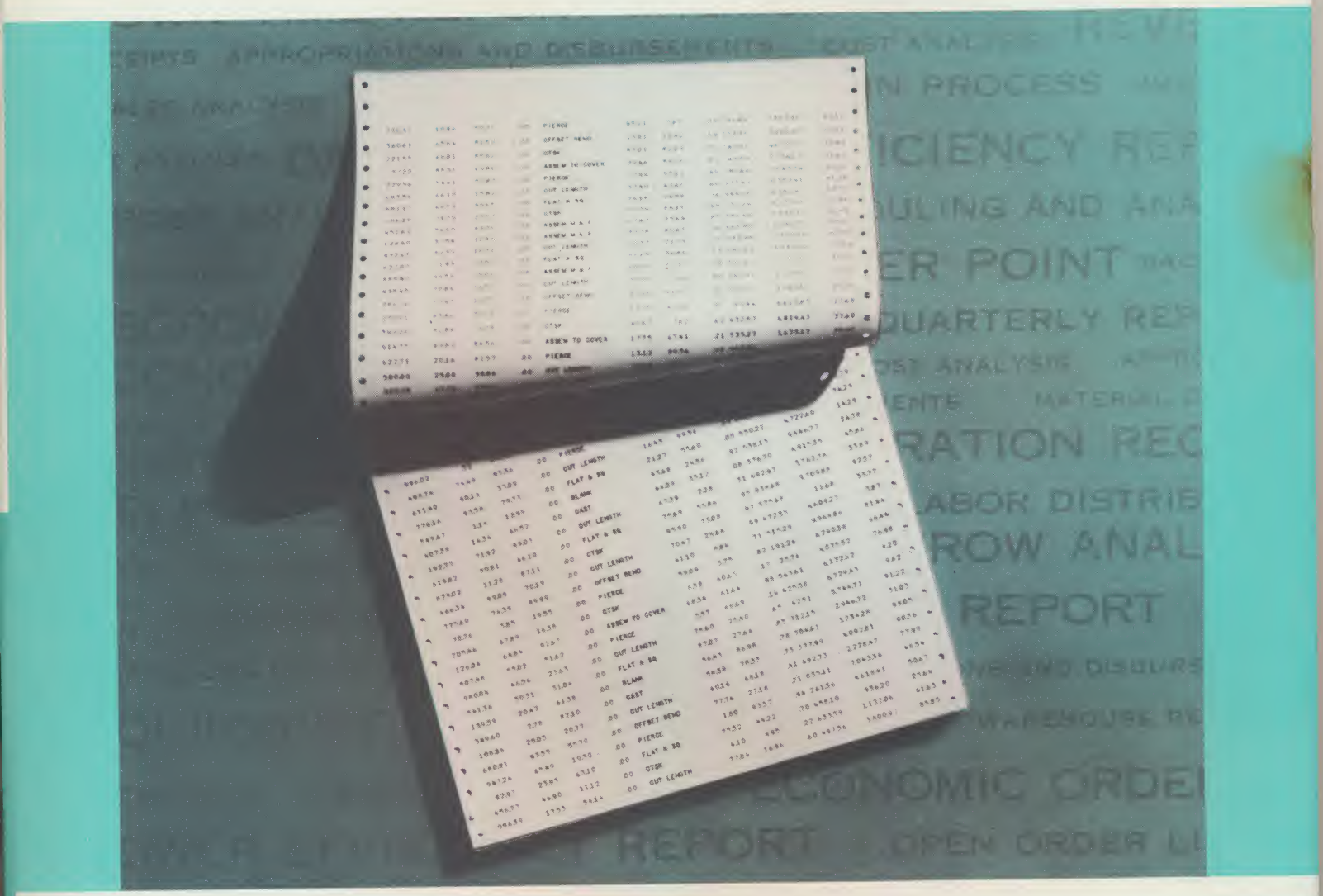
CARD DROP

Once a card has been called for by the computer, and the rods in the CRAM unit have been set, the magnetic card is dropped from its hanging position on the rods. The cards are separated by jets of air that permit the selected card to fall freely. After the card has been released, it is pulled by means of a vacuum onto a rotating drum and quickly accelerated to a speed of 380 inches per second.

READ-WRITE

While on the drum, the magnetic card passes over multiple read-write heads . . . one for each recording track. The read head automatically checks the accuracy of recording and performs its normal function. After reading or writing a track of data, the card may be retained on the drum to process data on the other tracks or it may be released. The card returns through a tunnel of moving air back to the rods where it is suspended until selected again . . . completely eliminating rewind time encountered with tape systems.

HIGH SPEED PRINTERS

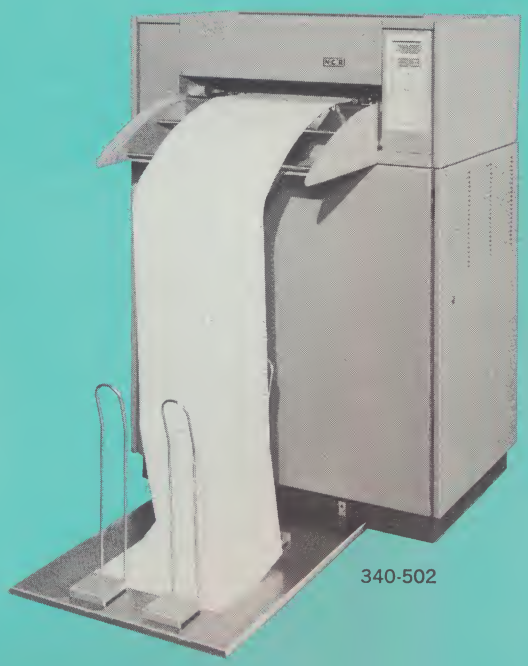


NCR High Speed Printers provide alphanumeric printing speeds of from 650 to 1000 lines per minute and numeric speeds of from 805 to 1000 lines per minute. The Model 340-512 features a fully buffered 24-column numeric lister with a rated speed of 1850 lines per minute.

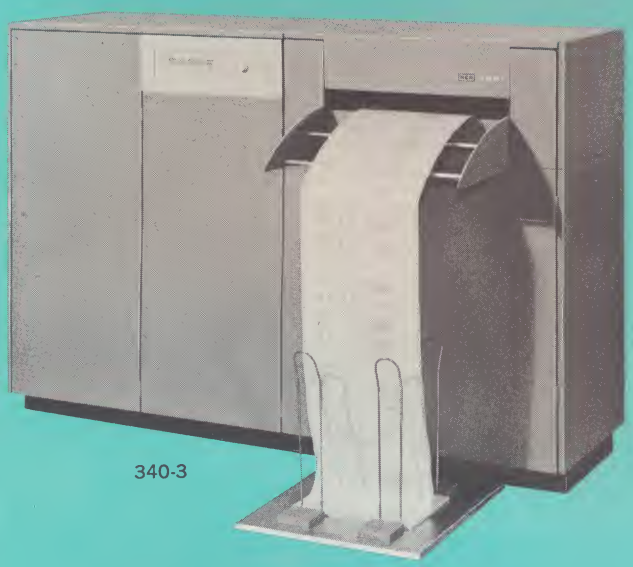
Computer programs determine whether printing or listing is to be performed. The printers have the ability to skip vertically between the print lines at the rate of 5400 lines per minute, regardless of the number of lines.

Interrupt feature for optimum time-sharing is incorporated in the printers, allowing processing to be time-shared between print cycles.

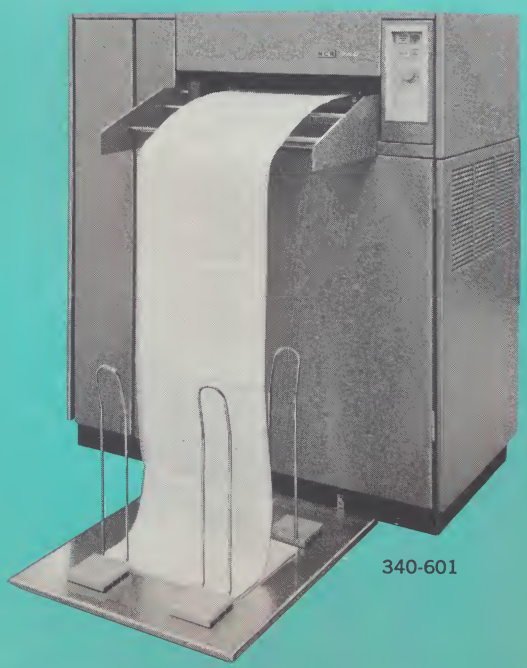
Up to four printers may be multiplexed. Multiple carbon copies may be made, and all types of commercial papers can be used . . . card stock, multilith masters, embossed documents.



340-502



340-3



340-601

340-3 Printer

- Prints 690 alphanumeric or 940 numeric lines per minute
- 56 alphanumeric characters on each of 120 print wheels
- Fully buffered

340-502 Printer

- Prints 650 alphanumeric or 805 numeric lines per minute
- 56 alphanumeric characters on each of 120 print wheels

340-503 Printer

- Prints up to 800 alphanumeric or numeric lines per minute
- 56 alphanumeric characters on each of 120 print wheels

340-512 Printer-Lister

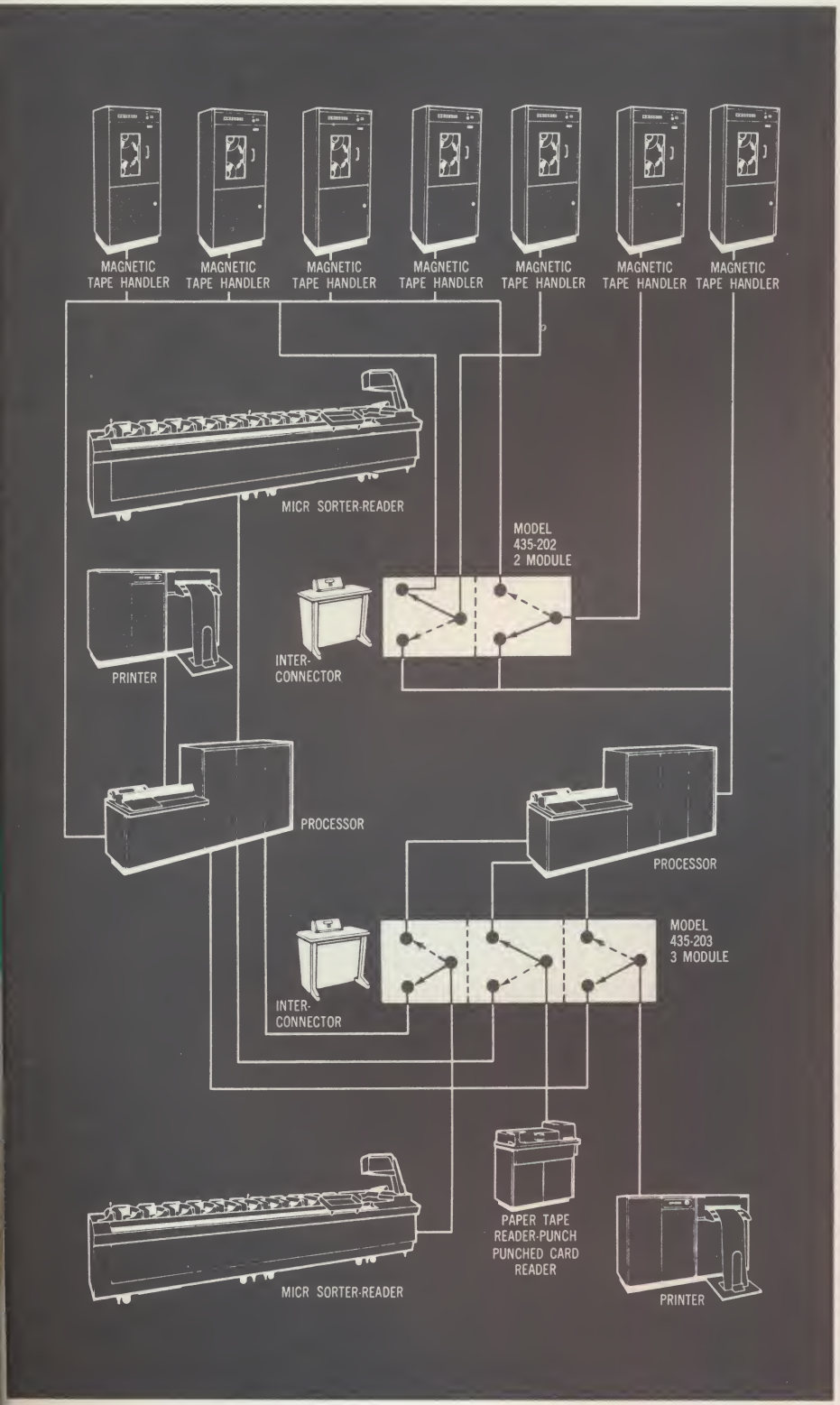
- Prints 650 alphanumeric or 805 numeric lines per minute
- Lister prints up to 1850 numeric lines per minute
- 56 alphanumeric characters on each of 96 print wheels
- Digits 0-9 plus one special symbol on each of 24 print wheels

340-601 Printer

- Prints up to 1000 alphanumeric or numeric lines per minute
- 56 alphanumeric characters on each of 120 print wheels
- Fully buffered

APPLICABLE TO ALL MODELS

- Vertically feeds 5400 lines per minute
- Time-sharing capabilities
- Unit demand interrupt feature
- Handles continuous forms 3½" to 22" wide, original and up to five copies (Lister models handle continuous forms from 3½", original and up to two copies)
- Up to four printers under control of processor



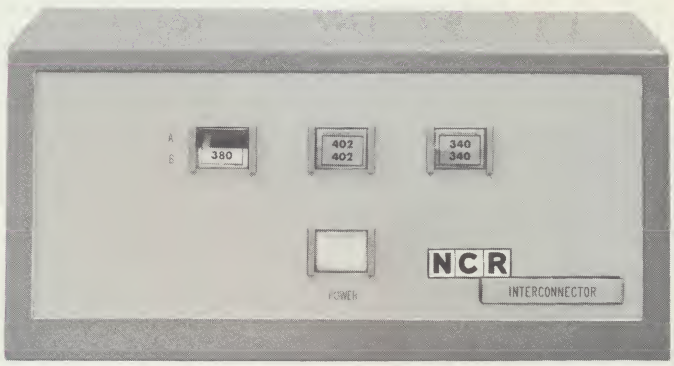
UNIVERSAL INTERCONNECTING DEVICE

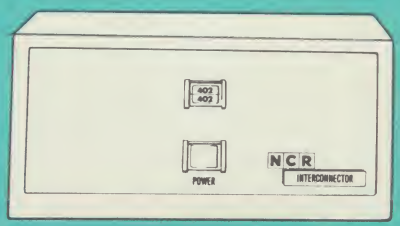
The NCR 435 Universal Interconnecting Device is designed for use with multiple 315 Systems where it is desirable to switch peripheral units from one System to another. Any unit which is to be switched between Systems must be cable connected to the Interconnector. A maximum of three peripheral units, other than magnetic files, may be switched between Systems by one Interconnecting Device. It requires one module to switch one peripheral unit between Systems.

When switching magnetic files (CRAM or Magnetic Tape) between Systems, it is possible to switch an entire trunk line or up to eight magnetic files with one module.

Switching is done automatically by solenoid operated switches actuated by pushbuttons on the console panel of the Interconnector. No cables need to be manually shifted.

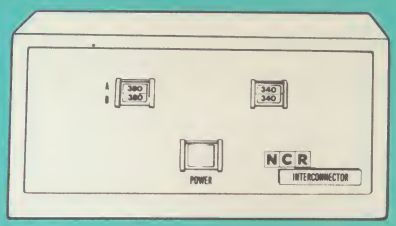
435-203





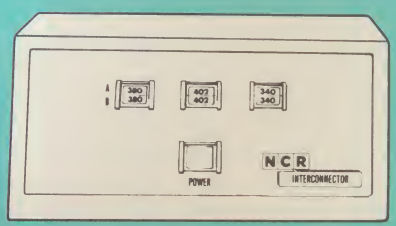
435-201

- One module



435-202

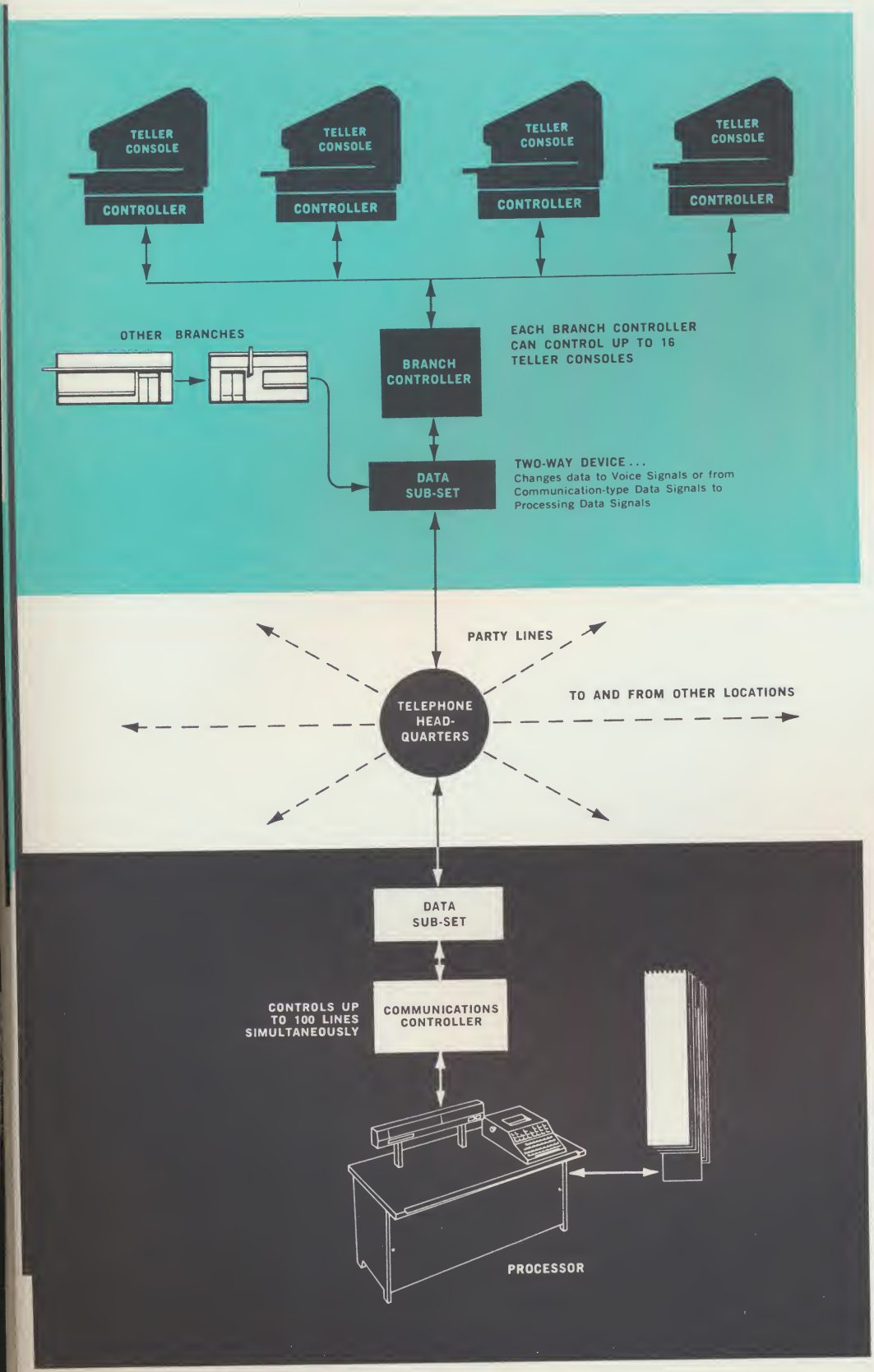
- Two module



435-203

- Three module

ON-LINE PROCESSING



REMOTE UNITS

CRAM, as an external memory device, makes the NCR 315 more than just another back-office electronic accounting machine. With the ability of CRAM to store vast amounts of data that can be accessed at random, the 315 is capable of receiving and processing transactions on-line **as they occur.**

A wide variety of machines may be used as remote input/output units. For real-time remittance control, for example, the NCR Class 42 is designed to post the customer's record, validate the posting media, print the audit journal, and provide input to the processor. The customer's master account, maintained on magnetic files, is accessed at random, amounts and statistical data are updated, and data is output to the on-line machine . . . all at electronic speeds. The number of such input/output devices is almost unlimited.

Each remote unit is connected to a controller which contains the wiring and control switching necessary to connect the remote machine to the Branch Controller. Up to 16 remote units may be connected to one Branch Controller which is, in turn, connected to a data subset, transmitting and receiving information over standard telephone voice-lines.

A low-cost, unbuffered Remote Inquiry System is also available for use with the 315. With this system, Teletype units are linked directly with the processor and act as input/output devices.

42-501

428-3

438-3

42-501 Savings Machine
42-502 Savings and Loan Machine

- Positive signature verification facility
- Ten totals facilitate transaction classification and final balancing
- Totals and subtotals lock protected . . . detector counter controlled
- All records original print . . . no carbon required
- Automatic, positive column selection on all forms
- Visual line selection on flat printing table
- Especially designed for use at teller windows

428-3 Window Machine Controller

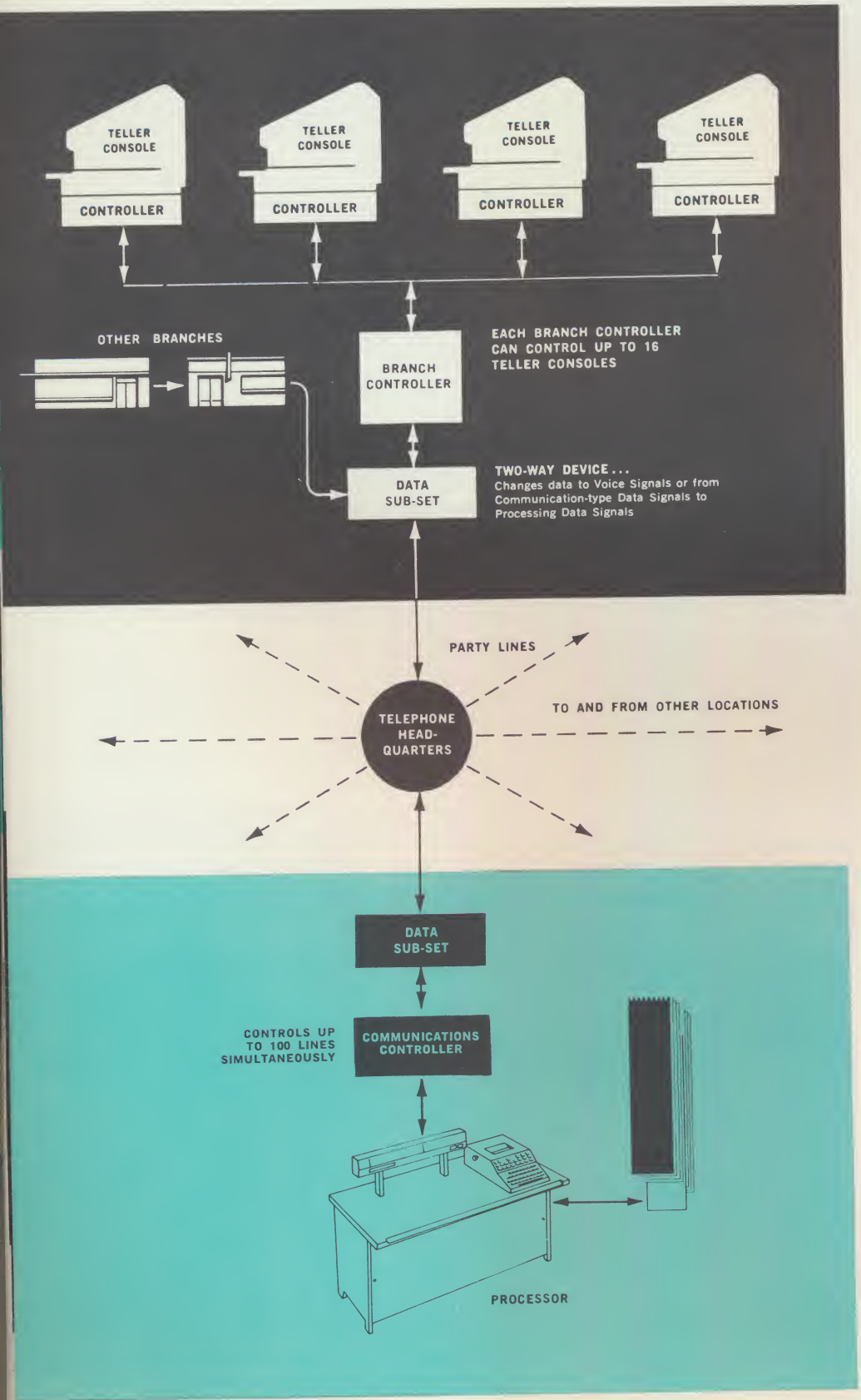
- Contains wiring and control switching necessary to connect remote machine to Branch Controller
- One required for each remote machine

438 Branch Controller

- Handles up to 16 remote machines
- Up to 8 on-line through one Inquiry Buffer

ON-LINE PROCESSING

CENTRAL UNITS



Within the central processing units, the functions of control, manipulation, subtraction, addition, and rearrangement of information are accomplished. Central units consist of the processor, main memory, CRAM, file units, and a wide variety of buffering and control units to facilitate receiving and sending information.

Most peripheral units incorporate an automatic interrupt feature to provide time-sharing. Concurrent operations can also be performed by allowing certain units to directly access the main memory without interrupting the processor.

Each 356 Inquiry Buffer permits a maximum of eight telephone trunk lines to communicate with the 315. Up to 16 Inquiry Buffers may be connected to one processor. Many remote input/output units may be associated with each communication line.

The 356-1 Inquiry Buffer has an internal storage capacity of one alphanumeric character and is generally used with single-character remote input/output devices such as Teletypes. The 356-3, with an internal storage capacity of 17 alphanumeric characters and one check digit, is for use with remote units such as window machines. It can also be adapted to accommodate Teletype equipment.

Communication Line Adapters (CLA) match, translate and control information flow between NCR equipment and telephone lines. Control characters, exchanged by central and remote locations, are interpreted by the CLA and converted into control signals.

The 321 Central Communication Controller permits direct message access to processor memory while an independent processing run is in operation. The Controller permits up to 100 messages to flow simultaneously, time-shared with other functions.

356-3

321-1

356-1 Inquiry Buffer (Teletype Inquiry)

- Buffer stores one alphanumeric character
- Receives data at 2,000 characters per second
- Outputs data at 1,000 characters per second
- Houses two pairs of Communication Line Adapter Teletype (CLAT)
- Requires one CLAT for each communication line
- Maximum distance from processor . . . 75 feet

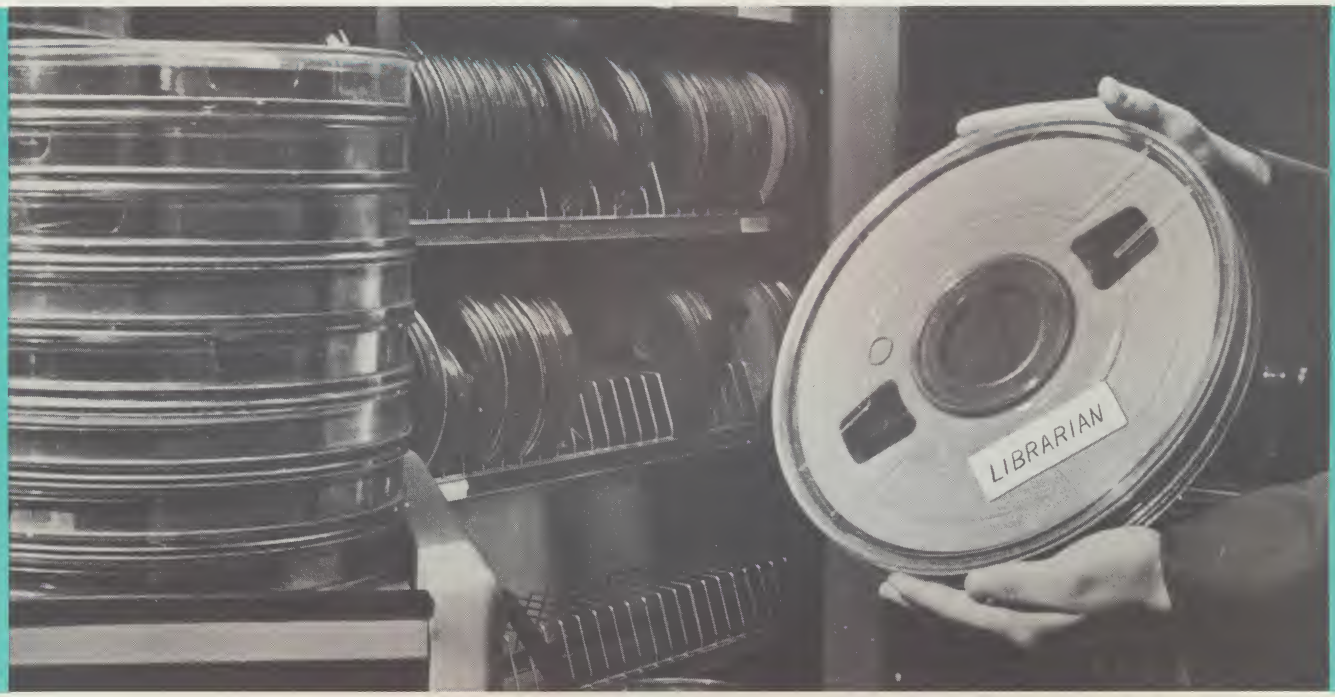
356-3 Inquiry Buffer

- Buffer stores 17 alphanumeric characters plus one check digit
- Receives data at 2,000 characters per second
- Outputs data at 1,000 characters per second
- Houses two pairs of Communication Line Adapters (CLA) or Communication Line Adapter Monitors (CLAM)
- Maximum distance from processor . . . 75 feet
- Maximum distance from Data Subset . . . 50 feet

321-1 Central Communication Controller

- Controls 100 communication lines simultaneously
- Provides direct access to processor memory

SOFTWARE

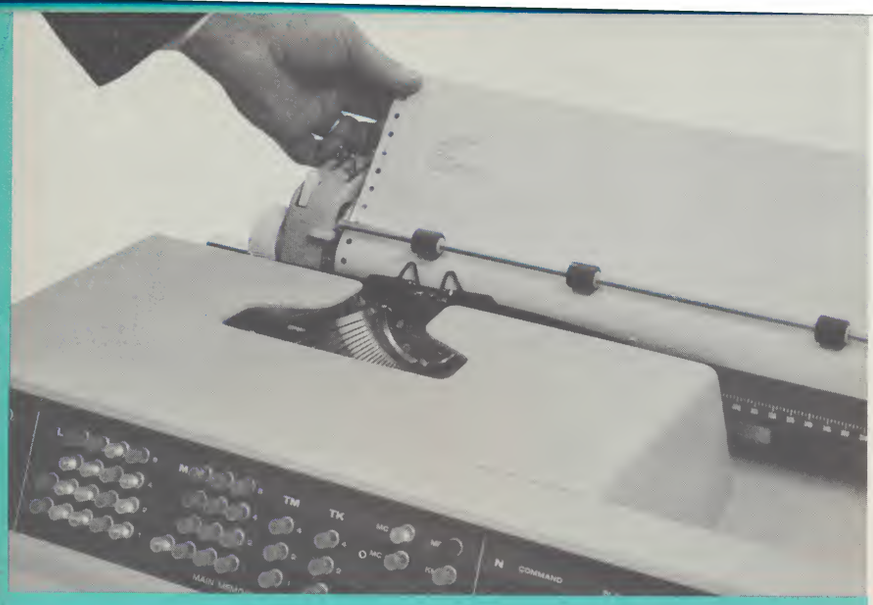


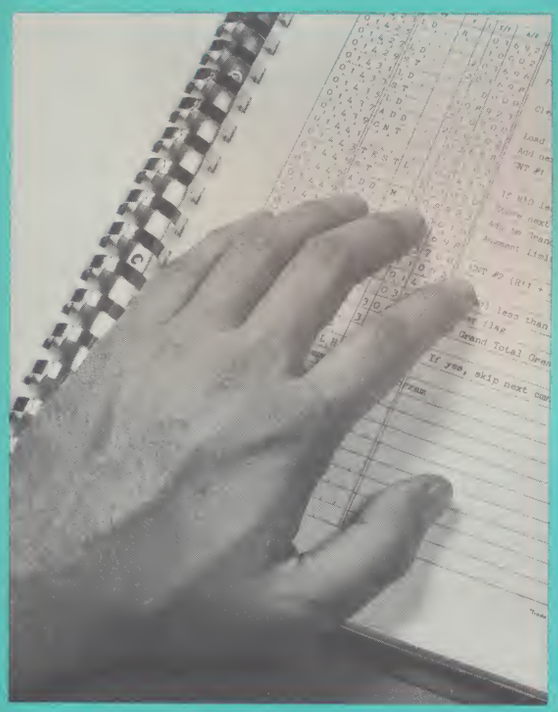
NCR has consistently devoted its programming research efforts toward the development of software for the 315 family of computers. Because of this concentrated effort, 315 users have enjoyed the use of the most efficient and sophisticated package of software available in the industry . . . time-tested and in daily use over a period of years.

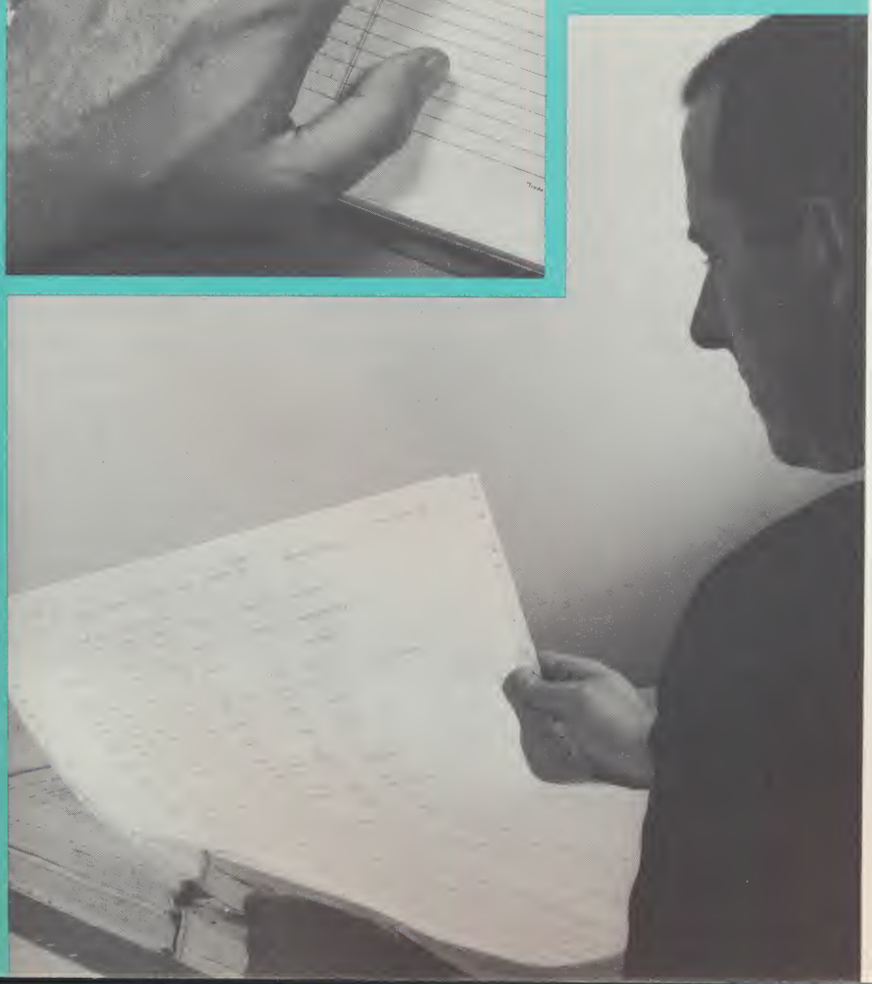
Since the command and data structure of one member of the 315 family has been designed to be identical with other members of the family, all are supported by this same highly advanced software. Programming compatibility means that users of one member of the 315 family can move up to a more sophisticated member when additional processing capabilities are required. This assures efficient, economical growth for all NCR 315 users, without the requirement of reprogramming . . . and without the added programming costs normally associated with the installation of additional computer facilities.

While this is important economically to present 315 users, such considerations cannot be neglected in the planning and evaluations of any system's true economy for those firms ready to embark into electronic data processing. The cost of programming represents a very important item which cannot be overlooked.

The entire 315 internal programming philosophy has been developed with full comprehension of three factors: internal speed; compatibility of machine instructions with automatic coding techniques; and, economical implementation of the system. The tremendous internal speed of the 315 has permitted NCR to develop highly sophisticated coding techniques without having to sacrifice over-all speed and systems performance.







SOFTWARE available to 315 users includes:

NEAT (NCR's Electronic Autocoding Techniques)

- Assembler
- Compiler
- BEST (Business EDP Systems Technique)
- COBOL Compiler (Common Business Oriented Language)
- NACPAC (NCR's Applied COBOL Packages)
- FAST (Flexible Algebraic Scientific Translator)
- FORTRAN (Formula Translator)

EXECUTIVE PACKAGES

- STEP (Standard Tape Executive Package)
- CRAM Executive Routine
- On-Line Executive

PROGRAMS

- CRAM Sort Generators
- CRAM Librarian
- Tape Sort Generators
- Tape Librarian

SCIENTIFIC ROUTINES

- Basic Engineering Routines
- Algebraic Functions
- Transcendental Functions
- Matrix Algebra
- Advanced Engineering Abstracts
- Basic Statistical Abstracts
- Linear Programming
- PERT (Program Evaluation and Reporting Technique)

MACROS

UTILITY ROUTINES

PRE-PROGRAMMED APPLICATIONS

Through close cooperation with users of the 315 family of computers, NCR has developed many programmed application packages. These packages are available to users in the fields of Banking, Retailing and Industry.

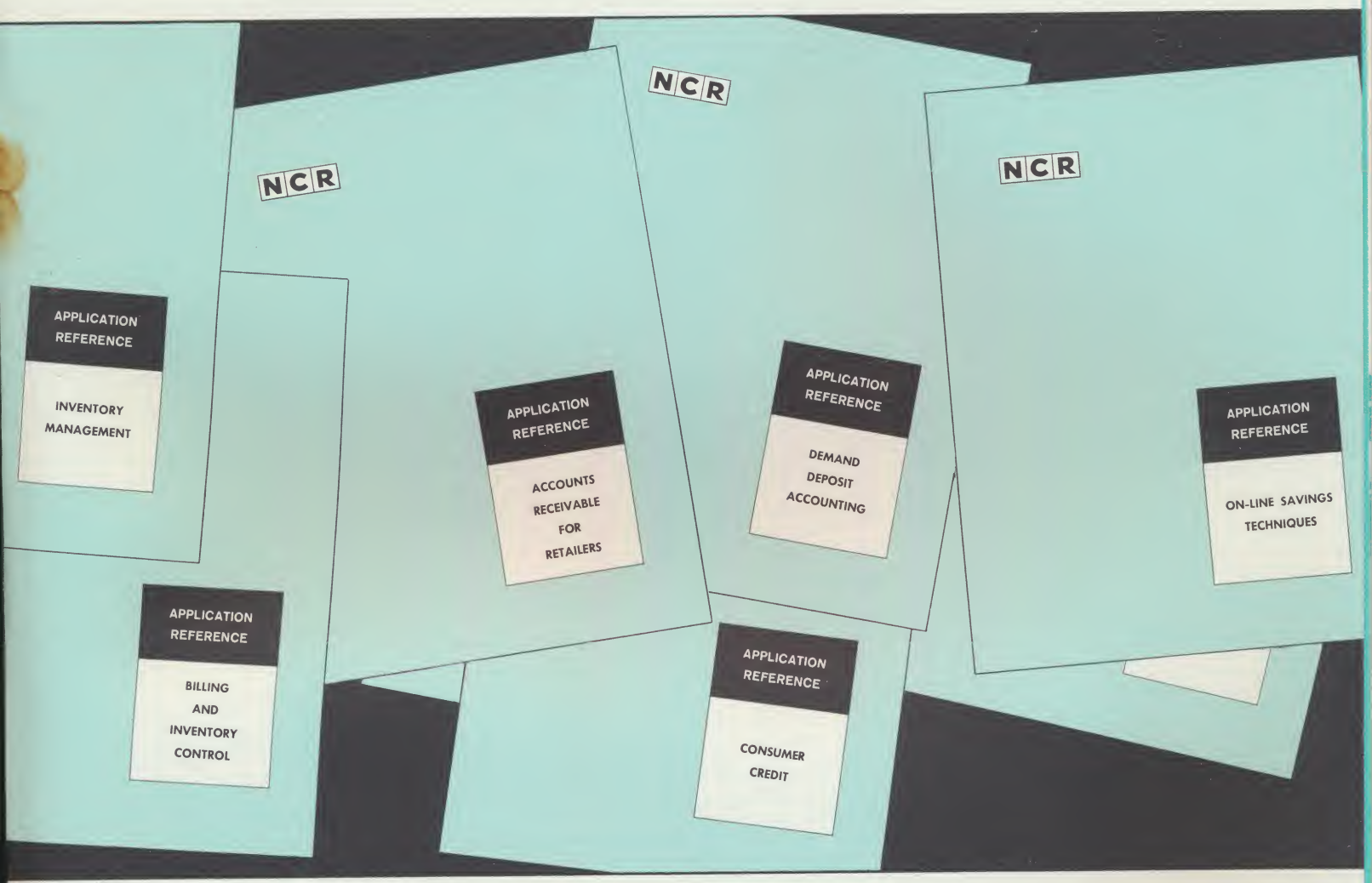
All systems have been designed in such a way that they can be easily modified. Thus, programs can be tailored to fit user needs without incurring excessive programming costs or forfeiting the sophistication provided by the package.

The systems make pertinent information available to all levels of management when needed. Exception information is made available to highlight those areas requiring immediate management attention.

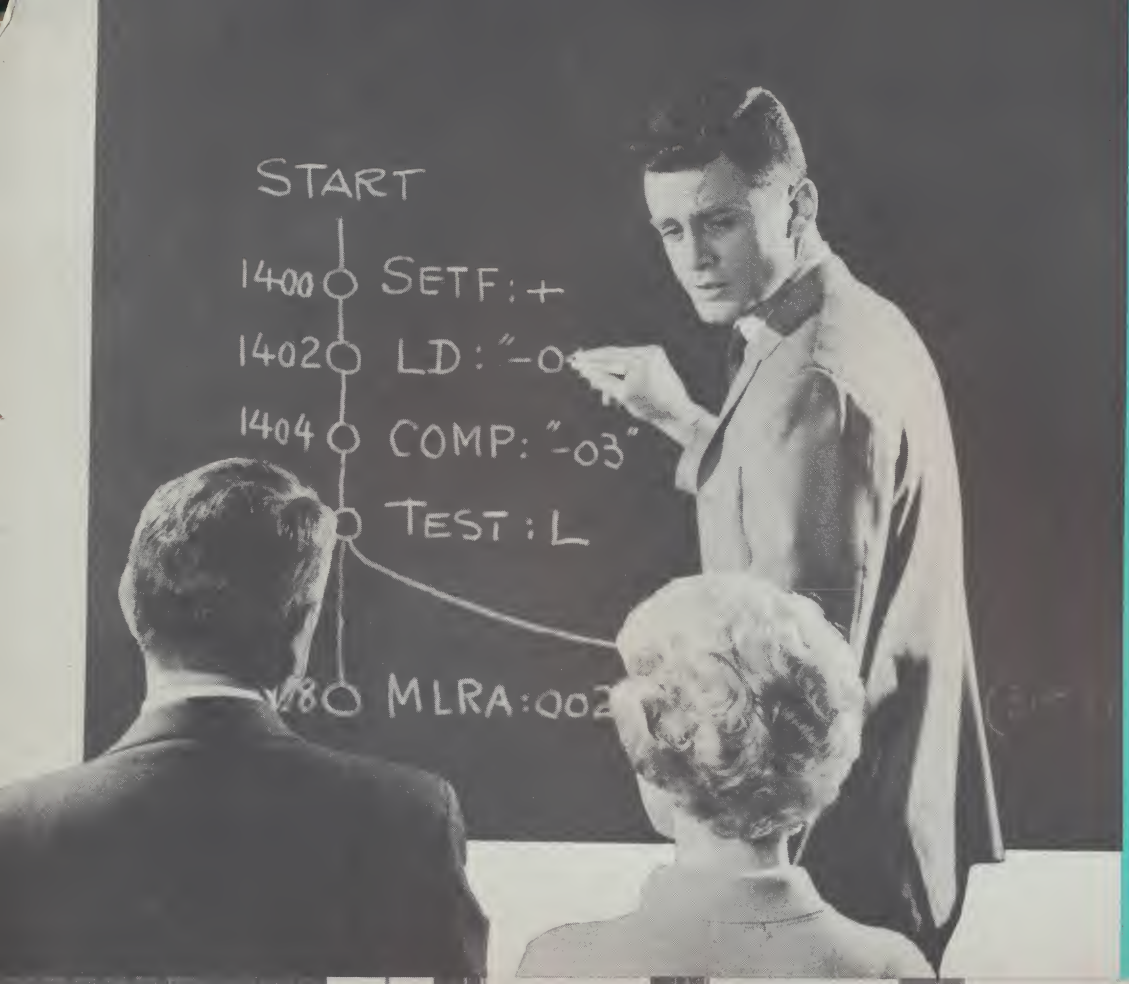
Through a series of reports, journals and listings, the systems provide effective control and establish complete audit trails which should satisfy even the most rigid auditing standards.

Some of the packages available include:

- DEMAND DEPOSIT ACCOUNTING . . . with CRAM or tape . . . will handle all phases of commercial bank demand deposits.
- MORTGAGE LOAN . . . designed to perform all functions usually associated with mortgage loan accounting, including payments, updating, and report generation.



- CONSUMER CREDIT . . . an all inclusive installment loan package for commercial banks.
- ORDER PROCESSING AND BILLING . . . provides the necessary routines to handle order processing and billing for a large wholesale type operation.
- ON-LINE SAVINGS AND LOANS . . . contains the necessary routines to be used in an on-line savings installation.
- ON-LINE AIR RESERVATIONS . . . includes all routines necessary to operate an airline reservation application on-line.
- ACCOUNTS RECEIVABLE FOR RETAILERS . . . a complete, flexible package designed to drastically reduce the time and cost involved in implementation of retail accounts receivable.
- INVENTORY MANAGEMENT . . . includes latest techniques in the areas of Mathematical Models, Simulation, Exponential Smoothing, Moving Averages, Forecasting, Safety Stock Estimating, and more.
- PAYROLL . . . applicable to all payroll systems.



CUSTOMER SERVICES

A user of NCR's family of 315 computers is entitled to a wide range of Integrated Customer Services in order to provide for the best possible installation and continued operations. There are four main areas of assistance which are included in the Customer Services area —Training, Programming Research, Customer Support, and Site Preparation.

These services are furnished without charge. The other associated services which fall outside the Customer Support function are maintenance, supplies, and back-up services of NCR Data Processing Centers.

Full compliment of compatible software.

Analysts provide procedures development assistance.

Modification of Packaged Programs shorten conversion time.

Industry specialists provide solutions to special problems.

Library of tested program generators.

Years of experience in systems design at your disposal.

Customer Support Representatives review, assist, and make recommendations.

On-Site engineers assure speedy program implementation.

NCR Data Centers available for program testing.

Comprehensive employee training.

Excellent facilities provide data processing education in depth . . . for management and programming personnel.

Planning engineers assist in site preparation.

Total Systems Support . . . from original entry through final report.

THE NATIONAL CASH REGISTER COMPANY, DAYTON, OHIO 45409

NCR

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